

ABSTRACT OF THE DISCLOSURE

A wave-based tomographic imaging method and apparatus based upon one or more rotating radially outward oriented transmitting and receiving elements have been developed for non-destructive evaluation. At successive angular locations at a fixed radius, a predetermined transmitting element can launch a primary field and one or more predetermined receiving elements can collect the backscattered field in a "pitch/catch" operation. A Hilbert space inverse wave (HSIW) algorithm can construct images of the received scattered energy waves using operating modes chosen for a particular application. Applications include, improved intravascular imaging, bore hole tomography, and non-destructive evaluation (NDE) of parts having existing access holes.